

POLICY STATEMENT ON THE USES OF TLVs® AND BEIs®

The Threshold Limit Values (TLVs®) and Biological Exposure Indices (BEIs®) are developed as guidelines to assist in the control of health hazards. These recommendations or guidelines are intended for use in the practice of industrial hygiene, to be interpreted and applied only by a person trained in this discipline. They are not developed for use as legal standards and ACGIH® does not advocate their use as such. However, it is recognized that in certain circumstances individuals or organizations may wish to make use of these recommendations or guidelines as a supplement to their occupational safety and health program. ACGIH® will not oppose their use in this manner, if the use of TLVs® and BEIs® in these instances will contribute to the overall improvement in worker protection. However, the user must recognize the constraints and limitations subject to their proper use and bear the responsibility for such use.

The Introductions to the TLV®/BEI® Book and the TLV®/BEI® Documentation provide the philosophical and practical bases for the uses and limitations of the TLVs® and BEIs®. To extend those uses of the TLVs® and BEIs® to include other applications, such as use without the judgment of an industrial hygienist, application to a different population, development of new exposure/recovery time models, or new effect endpoints, stretches the reliability and even viability of the database for the TLV® or BEI® as evidenced by the individual *Documentation*.

It is not appropriate for individuals or organizations to impose on the TLVs® or the BEIs® their concepts of what the TLVs® or BEIs® should be or how they should be applied or to transfer regulatory standards requirements to the TLVs® or BEIs®.

Approved by the ACGIH® Board of Directors on March 1, 1988.

Special Note to User

The values listed in this book are intended for use in the practice of industrial hygiene as guidelines or recommendations to assist in the control of potential workplace health hazards and for no other use. These values are *not* fine lines between safe and dangerous concentrations and *should not* be used by anyone untrained in the discipline of industrial hygiene. It is imperative that the user of this book read the Introduction to each section and be familiar with the *Documentation* of the TLVs® and BEIs® before applying the recommendations contained herein. ACGIH® disclaims liability with respect to the use of the TLVs® and BEIs®.

2017

TLVs® and BEIs®

Based on the Documentation of the

Threshold Limit
Values

for Chemical Substances
and Physical Agents



Biological Exposure
Indices



ACGIH®

Defining the Science of
Occupational and Environmental Health®

Signature Publications

HEAT STRESS AND STRAIN

Warning: While the TLV® is based on the ability of most healthy people to sustain a heat stress exposure, cases of heat stroke and other exertional heat illnesses do occur below the TLV®. A program of heat stress management should include acclimatization, early recognition of symptoms with appropriate first aid, and recognition of personal risk factors. Further, there is evidence of a carry-over effect from a previous day's exposure.

This TLV® applies only to workers who are heat acclimatized. It does not apply to workers with prior heat stroke or heat exhaustion, cardiac or kidney problems, pregnancy, or obesity, the older worker, and workers on certain medications.

This TLV® has a small margin of safety. Therefore, those working near the TLV® should be warned to drink water regularly and be alert for dizziness, lightheadedness, nausea, and headache.

Goal: The goal of this TLV® is to maintain body core temperature within + 1°C of normal (37°C) for the average person. For most individuals, body core temperature will be below 38.3°C. Body core temperature can exceed 38.3°C under certain circumstances with selected populations, environmental and physiologic monitoring, and other controls.

More than any other physical agent, the potential health hazards from work in hot environments depends strongly on physiological factors that lead to a range of susceptibilities depending on the level of acclimatization. Therefore, professional judgment is of particular importance in assessing the level of heat stress and physiological heat strain to adequately provide guidance for protecting nearly all healthy workers with due consideration of individual factors and the type of work. Assessment of both heat stress and heat strain can be used for evaluating the risk to worker safety and health. A decision-making process is suggested in Figure 1. The exposure guidance provided in Figures 1 and 2 and in the associated *Documentation of the TLV®* represents conditions under which it is believed that nearly all heat acclimatized, adequately hydrated, unmedicated, healthy workers may be repeatedly exposed without adverse health effects. The Action Limit (AL) is similarly protective of unacclimatized workers and represents conditions for which a heat stress management program should be considered. While not part of the TLV®, elements of a heat stress management program are offered. The exposure guidance is not a fine line between safe and dangerous levels.

Heat Stress is the net heat load to which a worker may be exposed from the combined contributions of metabolic heat, environmental factors (i.e., air temperature, humidity, air movement, and radiant heat), and clothing requirements. A mild or moderate heat stress may cause discomfort and may adversely affect performance and safety, but it is not harmful to health. As the heat stress approaches human tolerance limits, the risk of heat-related disorders increases.

Heat Strain is the overall physiological response resulting from heat stress. The physiological responses are dedicated to dissipating excess heat from the body.

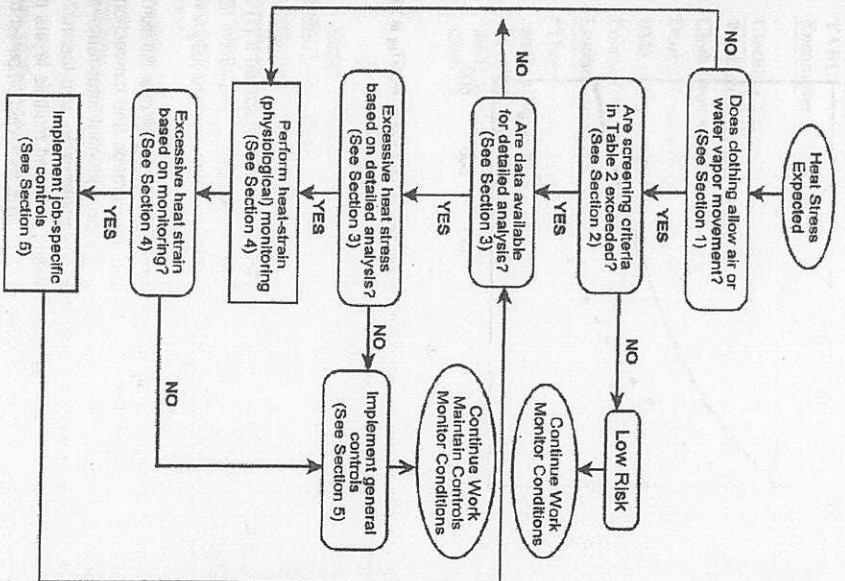


FIGURE 1. Evaluating heat stress and strain.

Acclimatization is a gradual physiological adaptation that improves an individual's ability to tolerate heat stress. Acclimatization requires physical activity under heat-stress conditions similar to those anticipated for the work. With a recent history of heat-stress exposures of at least two continuous hours (e.g., 5 of the last 7 days to 10 of 14 days), a worker can be considered acclimatized for the purposes of the TLV®. Its loss begins when the activity under those heat stress conditions is discontinued, and a noticeable loss occurs after four days and may be completely lost in three to four weeks. Because acclimatization is to the level of the heat stress exposure, a person will not be fully acclimatized to a sudden higher level, such as during a heat wave.